AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111
Serial Number: 10/051,757
Filing Date: January 16, 2002
Title: HEARING AIDS AND METHODS AND APPARATUS FOR AUDIO FITTING THEREOF

Page 2
Dkt: 899.056US1

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An apparatus for fitting a hearing aid <u>by its wearer</u>, comprising:

a memory ~~having~~ <u>adapted to store</u> a first population ~~stored therein, the first population~~ comprising a plurality of parent sets;

a toggle device ~~for toggling~~ <u>adapted to toggle</u> between a ~~first~~ pair of the plurality of parent sets;

a select indicator for selecting a preferred one set of the ~~first~~ pair; ~~and~~

a communications link ~~for interfacing with~~ <u>adapted to connect with</u> the hearing aid[[.]] <u>;</u> <u>and</u>

<u>a processor adapted to provide signals to the hearing aid to change operation of the hearing aid based on each parent set, to allow the wearer to select one preferred set for each pair of parent sets, to record a ranking of parent sets, assign probabilities of selection of parent sets, crossover and/or mutate at least one parent set, and replace weakest parent sets with a child set.</u>

2. (Original) The apparatus according to claim 1, wherein each parent set of the plurality of parent sets comprises more than one parameter.

3. (Original) The apparatus according to claim 1, wherein the communications link is a wireless link.

4. (Currently Amended) The apparatus according to claim 1, further comprising a ~~processor for ranking~~ <u>flash memory for storing</u> a hierarchy of the plurality of parent sets.

5. (Canceled)

6. (Canceled)

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111
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Page 3
Dkt: 899.056US1

7.   (Canceled)

8.   (Canceled)

9.   (Currently Amended) The apparatus of claim 8̶ 1, wherein the toggle device toggles between a second pair of sets selected from t̶h̶e̶ a second population.

10.   (Original) The apparatus of claim 1, wherein the toggle device toggles between a plurality of pairs of the plurality of parent sets, further comprising a processor for converging the plurality of pairs to a single solution set.

11.   (Original) A hearing aid fitted by the apparatus according to claim 1.

12.   (Original) An apparatus for fitting a hearing aid, comprising:

a memory having a first population stored therein, the first population comprising a plurality of parent sets;

a toggle device for toggling between a plurality of pairs of the plurality of parent sets, each of the plurality of pairs having a first and second set;

a select indicator for selecting a preferred one of the first and second set in the each of the plurality of pairs;

a genetic algorithm operator for performing one of mutation and crossover on at least one set of the plurality of parent sets thereby producing a child set;

a genetic algorithm for replacing one of the plurality of parent sets in the first population with the child set thereby forming a second population wherein the toggle device toggles between another pair of sets, the another pair being selected from the second population;

a processor for converging the sets of the plurality of pairs and the another pair to a single solution set; and

a communications link for interfacing with the hearing aid.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111
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Page 4
Dkt: 899.056US1

13.　(Original)　The apparatus according to claim 12, wherein the processor ranks a hierarchy of the plurality of parent sets.

14.　(Original)　The apparatus according to claim 13, wherein the processor assigns a probability of selection by the select indicator to the sets of the plurality of pairs and the another pair.

15.　(Original)　The apparatus according to claim 14, wherein the genetic algorithm decides which of the plurality of parent sets becomes the first and second sets for each the plurality of pairs.

16.　(Original)　A hearing aid fitted by the apparatus according to claim 12.

17.　(Original)　A hearing aid, comprising:

a memory having a first population stored therein, the first population comprising a plurality of parent sets, each of the parent sets having at least one parameter;

a toggle device for toggling between a first pair of the plurality of parent sets; and

a select indicator for selecting a preferred one set of the first pair.

18.　(Original)　The hearing aid according to claim 17, further comprising an initial prescription setting and a reset mechanism for updating the initial prescription setting with one of the at least one parameters.

19.　(Original)　The hearing aid according to claim 17, wherein the toggle device is one of a software algorithm and mechanical mechanism.

20.　(Original)　The hearing aid according to claim 17, further comprising a processor for ranking a hierarchy of the plurality of parent sets.

21.   (Original) The hearing aid according to claim 17, further comprising a processor for assigning a probability of selection by the select indicator to the plurality of parent sets.

22.   (Original) The hearing aid according to claim 17, wherein the plurality of parent sets comprises at least a first, second and third set, further comprising a genetic algorithm for deciding which of the first, second and third sets becomes the first pair.

23.   (Original) The hearing aid according to claim 17, further comprising a genetic algorithm operator for performing one of mutation and crossover on at least one set of the plurality of parent sets thereby forming a child set.

24.   (Original) The hearing aid according to claim 23, further comprising a genetic algorithm for replacing one of the plurality of parent sets in the first population with the child set thereby forming a second population.

25.   (Original) The hearing aid according to claim 24, wherein the toggle device toggles between a second pair of sets selected from the second population.

26.   (Original) The hearing aid according to claim 17, wherein the toggle device toggles between a plurality of pairs of the plurality of parent sets, further comprising a processor for converging the plurality of pairs to a single solution set.

27.   (Original) A method of fitting a hearing aid, comprising the steps:
        preparing a first population of a plurality of parent sets;
        presenting a first pair from the parent sets, the first pair comprising a first and second set and being presented with assistance of the hearing aid;
        selecting a first preference between the first and second sets of the first pair;
        operating on at least one set of the plurality of parent sets to obtain a child set, the child set being one of a mutation and crossover;

replacing one of the plurality of parent sets of the first population with the child set to form a second population;

presenting a second pair, the second pair comprising the child set and a third set, the third set being selected from the second population but not being the child set;

selecting a second preference between the child set and the third set of the second pair; and

converging on a solution set, the solution set being one of the first, second, third and child sets.

28.   (Original) The method according to claim 27, further comprising the step of ranking a hierarchy of the plurality of parent sets.

29.   (Original) The method according to claim 27, further comprising the step of assigning a probability of selection in one of the selecting steps to the first, second, third and child sets.

30.   (Original) The method according to claim 27, further comprising the step of deciding which set of the plurality of parent sets becomes the first and second sets of the first pair.

31.   (Original) A method of fitting a hearing aid, comprising the steps:

providing a hearing aid having an initial prescription;

preparing a population of a plurality of parent sets, each of the parent sets having at least one parent parameter;

presenting a first pair of sets from the parent sets, the first pair comprising a first and second set and being presented with assistance of the hearing aid;

selecting a first preference between the first and second sets of the first pair;

presenting a second pair of sets from the parent sets, the second pair comprising a third and fourth set;

selecting a second preference between the third and fourth sets of the second pair;

operating on one set of the plurality of parent sets to obtain a child set, the child set being one of a mutation and crossover of the one set, the child set having at least one child parameter;

replacing one of the plurality of parent sets of the first population with the child set to form a second population;

presenting a third pair of sets, the third pair comprising the child set and a fifth set, the fifth set being selected from the second population but not being the child set;

selecting a third preference between the child set and the fifth set;

converging on a solution set, the solution set being one of the first, second, third, fourth, fifth and child sets; and

updating the initial prescription with one of the at least one parent and child parameters.

32.   (Original) A method of using a genetic algorithm in a system having a first population of a plurality of parent sets, comprising the steps;

presenting a first pair of sets from the parent sets, the first pair comprising a first and second set, the genetic algorithm selecting which of the parent sets becomes the first and second set;

indicating a preference to the genetic algorithm between the first and second sets of the first pair;

operating on at least one set of the plurality of parent sets with a genetic algorithm operator to obtain a child set, the child set being one of a mutation and crossover;

replacing one of the plurality of parent sets of the first population with the child set to form a second population;

presenting a second pair, the second pair comprising the child set and a third set, the third set being selected from the second population but not being the child set, the genetic algorithm selecting which set of the second population becomes the third set;

indicating a second preference to the genetic algorithm between the child set and the third set of the second pair; and

converging on a solution set, the solution set being one of the first, second, third and child sets.

33.   (Original) A computer readable medium having executable instructions for performing the steps of claim 32.

34.   (Original) A method of perceptually tuning a system using a genetic algorithm, comprising the steps:

provide a system an initial setting;

preparing a population of a plurality of parent sets, each of the parent sets having at least one parent parameter;

presenting a first pair of sets from the parent sets, the first pair comprising a first and second set, the genetic algorithm selecting which of the plurality of parent sets becomes the first and second set;

indicating a first preference to the genetic algorithm between the first and second sets of the first pair;

presenting a second pair of sets from the parent sets, the second pair comprising a third and fourth set, the genetic algorithm selecting which of the plurality of parent sets becomes the third and fourth sets;

indicating a second preference to the genetic algorithm between the third and fourth sets of the second pair;

operating on one set of the plurality of parent sets with a genetic algorithm operator to obtain a child set, the child set being one of a mutation and crossover of the one set, the child set having at least one child parameter;

replacing one of the plurality of parent sets of the first population with the child set to form a second population;

presenting a third pair of sets, the third pair comprising the child set and a fifth set, the fifth set being selected from the second population but not being the child set, the genetic algorithm selecting which set of the second population becomes the fifth set;

indicating a third preference to the genetic algorithm between the child set and the fifth set;

converging on a solution set, the solution set being one of the first, second, third, fourth, fifth and child sets; and

updating the initial setting with one of the at least one parent and child parameters selected from the solution set.

35.   (Original) A computer readable medium having executable instructions for performing the steps of claim 34.

36-43. (Canceled)